**Claims**

1. A process for the production of liquefied natural gas utilising a refrigeration cycle, the process characterised by the steps of:

   i) Pre-treatment of a natural gas stream;

   ii) Chilling of either or both of the resulting pre-treated gas stream or a refrigerant gas stream within the refrigeration cycle; and

   iii) Liquefaction of the natural gas.

2. A process according to claim 1, wherein the chilling step is driven at least in part by waste heat from the liquefaction step.

3. A process according to claim 2, wherein the waste heat comprises hot jacket water and/or hot exhaust gases from the main gas engine or turbine driven compressor.

4. A process according to claim 1 or 2, wherein heat is provided from one or more of the group of prime movers, compressors, burning of flare or other waste gases or liquids, and solar power.

5. A process according to any one of the preceding claims, wherein waste heat from the liquefaction step is utilised, at least in part, in the gas pre-treatment step.

6. A process according to any one of the preceding claims the chilling step condenses certain components of the pre-treated natural gas stream.

7. A process according to claim 6, wherein components of the natural gas stream condensed in this manner include one or more of water, heavy hydrocarbons and/or carbon dioxide.

8. A process according to any one of the preceding claims, wherein the chilling step cools the gas stream to a temperature of between about –80°C and 10°C.

9. A process according to any one of the preceding claims, wherein the chilling of the pre-treated gas stream is conducted in a number of stages so as to allow the selective condensation and removal of various components thereof.

10. A process according to any one of the preceding claims, wherein the chilling of the refrigerant gas stream causes some components in the refrigerant gas to condense, the liquid thus formed being pumped and flashed to improve efficiency as in a conventional mixed refrigerant cycle.

11. A process according to any one of the preceding claims, wherein the chilling step utilises either a lithium bromide or an ammonia absorption chiller.

12. A process according to any one of the preceding claims, either a turbo-expander or 'JT' valve or nozzle device is added between the chilling step and the liquefaction step to further cool the natural gas stream.

13. An apparatus for the production of liquefied natural gas, the apparatus characterised by an absorption and/or membrane package for carbon dioxide removal, a dehydration package for water removal, a liquefaction package, at least one chiller and at least one refrigerant compressor package, the chiller being arranged so as to chill the natural gas stream to be liquefied.

14. An apparatus according to claim 13, wherein the liquefaction package further comprises the chiller arranged to chill a pre-treated natural gas stream from the solvent absorption and dehydration packages prior to passing that gas stream to a cryogenic heat exchanger.

15. An apparatus according to claim 13 or 14 , wherein the chiller is located before, or as a part of, the amine and/or membrane packages so as to assist in pre-treatment of the natural gas stream.

16. An apparatus according to any one of claims 13 to 15, wherein the chiller comprises one or more chiller stages.

17. An apparatus according to any one of claims 13 to 16 wherein the chiller is located in the refrigeration cycle to improve the efficiency thereof.

18. An apparatus according to any one of claims 13 to 16, wherein the chiller is located in both the natural gas stream and refrigeration cycle, or in either one thereof.

19. An apparatus according to any one of claims 13 to 18, wherein the chiller is driven by waste heat from the or each refrigerant compressor packages.

20. An apparatus according to claim 19, wherein waste heat is also directed to the amine package for amine regeneration and/or to the dehydration package for regeneration of molecular sieves used therein.

21. An apparatus according to any one of claims 13 to 20, wherein the chiller is provided in the form of either an ammonia or lithium bromide absorption chiller.

22. An apparatus according to claim 21, wherein the ammonia absorption chiller cools the gas stream to about –30 to -80°C whereas the lithium bromide absorption chiller cools the gas stream to about 0 to 10°C.

23. An apparatus according to any one of claims 13 to 22, wherein a turbo-expander or "JT" valve or nozzle device is added downstream of the chiller.

24. A refrigeration process in which waste heat is utilised to chill a process stream thereby reducing the refrigeration load.

25. A refrigeration process according to claim 24, wherein the refrigeration process is utilised in either of an air separation plant or an LPG extraction process.

26. A refrigeration process according to claim 24 or 25, wherein the refrigeration process is employed to pre-treat the gas.